

WHAT IS CLAIMED IS:

1. A method for trading a plurality of orders for at least one instrument comprising:
 - combining a value-based order for the at least one instrument and a share-based order for the at least one instrument to form a plurality of contingent orders for the at least one instrument; and
 - executing at least one trade according to one of the plurality of contingent orders.
2. A method for executing trades in at least one instrument comprising:
 - combining a value-based trading order for at least one instrument with a share-based trading order for the at least one instrument to create a final trading order for the at least one instrument; and
 - converting the final trading order into a series of contingent orders for the at least one instrument specifying a number of shares of the at least one instrument to be traded at a schedule of prices.
3. The method of claim 2, further comprising:
 - netting a plurality of value-based trading orders for at least one instrument against each other to create a net value-based trading order for the at least one instrument.
4. The method of claim 2, further comprising:

netting a plurality of share-based trading orders for the at least one instrument against each other to create a net share-based trading order for the at least one instrument.

5. The method of claim 2, further comprising:

converting a value-based trading order for the at least one instrument and a share-based trading order for the at least one instrument into a series of contingent orders for the at least one instrument specifying a number of shares of the at least one instrument to be traded at a schedule of prices.

6. The method according to claim 2, further comprising:

modifying an amount specified in a value-based sell order, if a total value of a quantity of the instrument held by an originator of the value-based sell order in a specified value basis in the value-based sell order, based on a prevailing price of the instrument, is less than the amount specified in the value-based sell order.

7. The method according to claim 6, further comprising:

if a total value of a quantity of the instrument held by an originator of a value-based sell order in a specified value basis in the value-based sell order, based on a prevailing price of the instrument, is less than the amount specified in the value-based sell order, modifying the amount of the value-based sell order to be equal to the total value of the quantity of the instrument held by the originator of the value-based sell order in the specified value basis using the prevailing price of the instrument.

8. The method according to claim 7, further comprising repeating both of the modifying steps until the amount in the value-based sell order for all prices in the schedule of prices is less than or equal to the value of the total quantity of the instrument held by the originator of the value-based sell order.

9. The method according to claim 2, further comprising calculating the number of shares of the at least one instrument in the schedule of prices according to the following equation:

$$S^* = (N_s^b - N_s^s) + (N_s^b - N_s^s)/P$$

wherein

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders;

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders; and

P = a price of the at least one instrument, where P is permitted to vary over a predetermined range.

10. The method according to claim 9, further comprising rounding to a nearest integer any value for the calculated number of shares in the schedule of prices that includes a fractional share.

11. The method according to claim 2, further comprising calculating the number of shares of the at least one instrument in the schedule of prices according to the following equations:

for a buy order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P^*} - \frac{N_s^s}{P_m}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

wherein:

$$\alpha = N_s^b,$$

$$\beta = N_s^b - N_s^s P_m - N_s^s - P_a \left(N_s^b - N_s^s - \frac{N_s^s}{P_m} \right), \text{ and}$$

$$\gamma = -P_a N_s^b;$$

for a sell order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P_m} - \frac{N_s^s}{P^*}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

where

$$\alpha = -N_s^s,$$

$$\beta = -N_s^s + N_s^b P_m + N_s^b - P_b \left(-N_s^s + N_s^b + \frac{N_s^b}{P_m} \right), \text{ and}$$

$$\gamma = P_b N_s^s;$$

wherein:

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P^* ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders; and

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders.

12. A computer readable medium storing instructions that, when executed by a processor, cause the processor to:

combine a value-based order for the at least one instrument and a share-based order for the at least one instrument to form a plurality of contingent orders for the at least one instrument; and

execute at least one trade according to one of the plurality of contingent orders.

13. A computer readable medium storing instructions that, when executed by a processor, cause the processor to:

combine a value-based trading order for at least one instrument with a share-based trading order for the at least one instrument to create a final trading order for the at least one instrument; and

convert the final trading order into a series of contingent orders for the at least one instrument specifying a number of shares of the at least one instrument to be traded at a schedule of prices.

14. The medium of claim 13, the instructions further causing the processor to:
 net a plurality of value-based trading orders for at least one instrument against
 each other to create a net value-based trading order for the at least one instrument.

15. The medium of claim 13, the instructions further causing the processor to:
 net a plurality of share-based trading orders for the at least one instrument against
 each other to create a net share-based trading order for the at least one instrument.

16. The medium of claim 13, the instructions further causing the processor to:
convert a value-based trading order for the at least one instrument and a share-based trading order for the at least one instrument into a series of contingent orders for the at least one instrument specifying a number of shares of the at least one instrument to be traded at a schedule of prices.

wherein

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders;

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders; and

P = a price of the at least one instrument, where P is permitted to vary over a predetermined range.

21. The medium of claim 20, the instructions further causing the processor to: round to a nearest integer any value for the calculated number of shares in the schedule of prices that includes a fractional share.

22. The medium of claim 13, the instructions further causing the processor to: calculate the number of shares of the at least one instrument in the schedule of prices according to the following equations:

for a buy order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P^*} - \frac{N_s^s}{P_m}$$

[illegible]

$$\beta = N_s^b - N_s^s P_m - N_s^s - P_a \left(N_s^b - N_s^s - \frac{N_s^s}{P_m} \right), \text{ and}$$

for a sell order:

where

$$\beta = -N_s^s + N_s^b P_m + N_s^b - P_b \left(-N_s^s + N_s^b + \frac{N_s^b}{P_m} \right), \text{ and}$$

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[illegible]

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders.

24. A method for executing trades in at least one instrument comprising:

netting a plurality of value-based trading orders for at least one instrument against each other to create a net value-based trading order for the at least one instrument;

netting a plurality of share-based trading orders for the at least one instrument against each other to create a net share-based trading order for the at least one instrument;

and

converting the net value-based trading order for the at least one instrument and the net share-based trading order for the at least one instrument into a series of contingent orders for the at least one instrument specifying a number of shares of the at least one instrument to be traded at a schedule of prices.

25. The method according to claim 24, further comprising:

modifying an amount specified in a value-based sell order, if a total value of a quantity of the instrument held by an originator of the value-based sell order in a specified value basis in the value-based sell order, based on a prevailing price of the instrument, is less than the amount specified in the value-based sell order.

26. The method according to claim 25, further comprising:

modifying said amount of the value-based sell order to be equal to the total value of the quantity of the instrument held by the originator of the value-based sell order in the specified value basis using the prevailing price of the instrument.

27. The method according to claim 26, further comprising repeating both of the modifying steps until the amount in the value-based sell order for all prices in the schedule of prices is less than or equal to the value of the total quantity of the instrument held by the originator of the value-based sell order.

28. The method according to claim 24, further comprising calculating the number of shares of the at least one instrument in the schedule of prices according to the following equation:

$$S^* = (N_s^b - N_s^s) + (N_s^b - N_s^s)/P$$

wherein

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders;

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders; and

P = a price of the at least one instrument, where P is permitted to vary over a predetermined range.

29. The method according to claim 28, further comprising rounding to a nearest integer any value for the calculated number of shares in the schedule of prices that includes a fractional share.

30. The method according to claim 24, further comprising calculating the number of shares of the at least one instrument in the schedule of prices according to the following equations:

(1) for a buy order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P^*} - \frac{N_s^s}{P_m}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

wherein:

$$\alpha = N_s^b,$$

$$\beta = N_s^b - N_s^s P_m - N_s^s - P_a \left(N_s^b - N_s^s - \frac{N_s^s}{P_m} \right), \text{ and}$$

$$\gamma = -P_a N_s^b;$$

(2) for a sell order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P_m} - \frac{N_s^s}{P^*}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

where

$$\alpha = -N_s^s,$$

$$\beta = -N_s^s + N_s^b P_m + N_s^b - P_b \left(-N_s^s + N_s^b + \frac{N_s^b}{P_m} \right), \text{ and}$$

$$\gamma = P_b N_s^s;$$

wherein:

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P^* ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders; and

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders.

31. An apparatus for trading a plurality of orders for at least one instrument comprising:

a processor coupled to a memory containing instructions that when executed by the processor cause the processor to receive a plurality of value-based orders for the at least one instrument from a first plurality of investors via said communications network, and to receive a plurality of share-based orders for the at least one instrument from a second plurality of investors via said communications network; and

transmit a plurality of contingent orders to a third party market maker for a trade in the at least one instrument.

32. The apparatus according to claim 31, wherein the instructions further cause the processor to store the received plurality of value-based orders for the at least one instrument and the plurality of share-based orders for the at least one instrument.

33. An apparatus for executing trades in at least one instrument comprising:
a processor coupled to a memory containing instructions that when executed by the processor cause the processor to receive a plurality of trading orders, including a plurality of value-based trading orders and a plurality of share-based trading orders;
net a plurality of value-based trading orders for at least one instrument against each other to create a net value-based trading order for the at least one instrument;
net a plurality of share-based trading orders for the at least one instrument against each other to create a net share-based trading order for the at least one instrument; and
convert the net value-based trading order for the at least one instrument and the net share-based trading order for the at least one instrument into a series of contingent orders for the at least one instrument specifying a number of shares of the at least one instrument to be traded at a schedule of prices; and
transmit the series of contingent orders for the at least one instrument to a third party market maker for execution.

34. The apparatus according to claim 33, wherein the instructions further cause the processor to store the plurality of value-based orders and the plurality of share-based orders and the series of contingent orders.

35. The apparatus according to claim 33, wherein the instructions further cause the processor to modify an amount of a value-based sell order, if a total value of the quantity of the instrument held by the originator of the value-based sell order in a specified value basis in the value-based sell order, based on a prevailing price of the instrument, is less than the amount specified in the value-based sell order.

36. The apparatus according to claim 35, wherein the instructions further cause the processor to modify said amount of the value-based sell order to be equal to the total value of the quantity of the instrument held by the originator of the value-based sell order in the specified value basis using the prevailing price of the instrument.

37. The apparatus according to claim 36, wherein the instructions further cause the processor to repeatedly iterate the netting function, the converting function, and the modifying function until the amount in the value-based sell order for all prices in the schedule of prices is less than or equal to the value of the total quantity of the instrument held by the originator of the value-based sell order.

38. The apparatus according to claim 33, wherein the instructions further cause the processor to calculate the number of shares of the at least one instrument in the schedule of prices according to the following equation:

$$S^* = (N_s^b - N_s^s) + (N_s^b - N_s^s)/P$$

wherein

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders;

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders; and

P = a price of the at least one instrument, where P is permitted to vary over a predetermined range.

39. The apparatus according to claim 38, wherein the instructions further cause the processor to round to a nearest integer any value for the calculated number of shares in the schedule of prices that includes a fractional share.

40. The apparatus according to claim 33, wherein the instructions further cause the processor to calculate the number of shares of the at least one instrument in the schedule of prices according to the following equations:

(1) for a buy order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P^*} - \frac{N_s^s}{P_m}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

wherein:

$$\alpha = N_s^b,$$

$$\beta = N_s^b - N_s^s P_m - N_s^s - P_a \left(N_s^b - N_s^s - \frac{N_s^s}{P_m} \right), \text{ and}$$

$$\gamma = -P_a N_s^b;$$

(2) for a sell order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P_m} - \frac{N_s^s}{P^*}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

where

$$\alpha = -N_s^s,$$

$$\beta = -N_s^s + N_s^b P_m + N_s^b - P_b \left(-N_s^s + N_s^b + \frac{N_s^b}{P_m} \right), \text{ and}$$

$$\gamma = P_b N_s^s;$$

wherein:

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P^* ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_d^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders; and

N_d^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders.

41. An apparatus for processing a plurality of trading orders for an instrument comprising:

a processor coupled to a memory containing instructions that when executed by the processor cause the processor to:

receive a plurality of value-based trading orders, each specified in a particular value basis,

receive a plurality of share-based trading orders; net all value-based trading orders in a similar value basis to create a plurality of net-similar-value-basis-value-based trading orders,

convert the plurality of net-similar-value-basis-value-based trading orders into a plurality of standard-currency-based trading orders using a predetermined exchange rate with regard to the value basis in the standard currency,

net the plurality of standard-currency-based trading orders to create a net standard-currency-based trading order,

convert the net standard-currency-based trading order to a converted share-based trading order using a predetermined price for the instrument in the standard currency, and

net the converted standard-currency-based trading order and the plurality of share-based trading orders to form a plurality of contingent orders.

42. A method for trading a plurality of orders for at least one instrument comprising the steps of:

receiving a plurality of value-based orders for the at least one instrument from a first plurality of investors;

receiving a plurality of share-based orders for the at least one instrument from a second plurality of investors; and

executing one of a plurality of contingent orders in the at least one instrument.

43. The method according to claim 42, further comprising the steps of:

aggregating all value-based buy orders for the at least one instrument into a single value-based buy order for the at least one instrument; and

aggregating all value-based sell orders for the at least one instrument into a single value-based sell order for the at least one instrument.

[illegible]

aggregating all share-based sell orders for the at least one instrument into a single share-based sell order for the at least one instrument.

netting the single dollar-based buy order for the at least one instrument against the single value-based sell order for at least one instrument to form a single value-based trading order for the at least one instrument.

netting the single share-based buy order for the at least one instrument against the single share-based sell order for at least one instrument to form a single share-based trading order for the at least one instrument.

aggregating all value-based buy orders for the at least one instrument into a single value-based buy order for the at least one instrument;

aggregating all value-based sell orders for the at least one instrument into a single value-based sell order for the at least one instrument;

aggregating all share-based buy orders for the at least one instrument into a single share-based buy order for the at least one instrument;

aggregating all share-based sell orders for the at least one instrument into a single share-based sell order for the at least one instrument;

netting the single value-based buy order for the at least one instrument against the single value-based sell order for at least one instrument to form a single value-based trading order for the at least one instrument;

netting the single share-based buy order for the at least one instrument against the single share-based sell order for at least one instrument to form a single share-based trading order for the at least one instrument.

48. The method according to claim 47, further comprising the step of:

converting the single value-based trading order for the at least one instrument into a share-based trading order for the at least one instrument using a predetermined price per share.

49. The method according to claim 48, further comprising the step of:

netting the converted single value-based trading order for the at least one instrument against the single share-based trading order for the at least one instrument to form a plurality of contingent orders for the at least one instrument.

50. The method according to claim 48, wherein the predetermined price includes a midpoint between a bid price and an ask price.

51. The method according to claim 48, wherein the predetermined price includes a weighted average of a bid price and an ask price.

52. The method according to claim 48, wherein the predetermined price includes a weighted average of a midpoint between a bid price and an ask price and either a bid price or an ask price.

53. The method according to claim 48, wherein the predetermined price includes, for sell orders, a weighted average of a bid price and a midpoint between the bid price and an ask price, and for buy orders, a weighted average of the ask price and the midpoint.

54. The method according to claim 48, wherein when buy orders exceed sell orders the predetermined price includes, for buy orders, a weighted average of an ask price and a midpoint between a bid price and the ask price, and for sell orders, the midpoint.

55. The method according to claim 48, wherein when sell orders exceed buy orders the predetermined price includes, for sell orders, a weighted average of a bid price and a midpoint between the bid price and an ask price, and for buy orders, the midpoint.

56. A method for executing trades in at least one instrument comprising the steps of:

aggregating and netting a plurality of value-based trading orders for at least one instrument against each other to create a single value-based trading order for the at least one instrument;

aggregating and netting a plurality of share-based trading orders for the at least one instrument against each other to create a single share-based trading order for the at least one instrument; and

converting the single value-based trading order for the at least one instrument and the single share-based trading order for the at least one instrument into a series of contingent orders for the at least one instrument specifying a number of shares of the at least one instrument to be traded at a schedule of prices.

57. The method according to claim 56, further comprising:

modifying an amount of a value-based sell order, if a total value of the quantity of the instrument held by the originator of the value-based sell order in a specified value basis in the value-based sell order, based on a prevailing price of the instrument, is less than the amount specified in the value-based sell order:

58. The method according to claim 57, further comprising:

modifying said amount of the value-based sell order to be equal to the total value of the quantity of the instrument held by the originator of the value-based sell order in the specified value basis using the prevailing price of the instrument.

59. The method according to claim 58, further comprising repeating both of the aggregating and netting steps, the converting step and the modifying steps until the amount in the value-based sell order for all prices in the schedule of prices is less than or equal to the value of the total quantity of the instrument held by the originator of the value-based sell order.

60. The method according to claim 46, further comprising the step of calculating the number of shares of the at least one instrument in the schedule of prices according to the following equation:

$$S^* = (N_s^b - N_s^s) + (N_s^b - N_s^s)/P$$

wherein

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders;

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders; and

P = a price of the at least one instrument, where P is permitted to vary over a predetermined range.

61. The method according to claim 60, further comprising the step of rounding to a nearest integer any value for the calculated number of shares in the schedule of prices that includes a fractional share.

62. The method according to claim 46, further comprising the step of calculating the number of shares of the at least one instrument in the schedule of prices according to the following equations:

(1) for a buy order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P^*} - \frac{N_s^s}{P_m}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases} \quad \pm \pm$$

wherein:

$$\alpha = N_s^b,$$

$$\beta = N_s^b - N_s^s P_m - N_s^s - P_a \left(N_s^b - N_s^s - \frac{N_s^s}{P_m} \right), \text{ and}$$

$$\gamma = -P_a N_s^b;$$

(2) for a sell order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P_m} - \frac{N_s^s}{P^*}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

where

$$\alpha = -N_s^s,$$

$$\beta = -N_s^s + N_s^b P_m + N_s^b - P_b \left(-N_s^s + N_s^b + \frac{N_s^b}{P_m} \right), \text{ and}$$

$$\gamma = P_b N_s^s;$$

wherein:

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P^* ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders; and

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders.

63. A method for processing a plurality of trading orders for an instrument comprising the steps of:

- receiving a plurality of currency-based trading orders;
- receiving a plurality of share-based trading orders;
- aggregating and netting all currency-based trading orders in a similar currency to create a plurality of single-similar-currency-based trading orders;
- converting the plurality of single-similar-currency-based trading orders into a plurality of standard-currency-based trading orders using a predetermined currency exchange rate;
- aggregating and netting the plurality of standard-currency-based trading orders to create a single standard-currency-based trading order;
- converting the single standard-currency-based trading order to a share-based trading order using a predetermined price for the instrument in the standard currency; and
- aggregating and netting the converted single standard-currency-based trading order and the single share-based trading order to form a plurality of contingent orders.

64. A method for processing a plurality of trading orders for an instrument comprising the steps of:

- receiving a plurality of value-based trading orders, each specified in a particular value basis;
- receiving a plurality of share-based trading orders;
- aggregating and netting all value-based trading orders in a similar value basis to create a plurality of single-similar-value-basis-value-based trading orders;

converting the plurality of single-similar-value-basis-value-based trading orders into a plurality of standard-currency-based trading orders using a predetermined exchange rate with regard to the value basis in the standard currency;

aggregating and netting the plurality of standard-currency-based trading orders to create a single standard-currency-based trading order;

converting the single standard-currency-based trading order to a share-based trading order using a predetermined price for the instrument in the standard currency; and

aggregating and netting the converted single standard-currency-based trading order and the single share-based trading order to form a plurality of contingent orders.

65. An apparatus for trading a plurality of orders for at least one instrument comprising the steps of:

a central controller for coupling to a communications network and to a third party market maker, said central controller receiving a plurality of value-based orders for the at least one instrument from a first plurality of investors via said communications network, and receiving a plurality of share-based orders for the at least one instrument from a second plurality of investors via said communications network; and

a database storing the received plurality of value-based orders for the at least one instrument and the plurality of share-based orders for the at least one instrument, wherein said central controller transmits a plurality of contingent orders to a third party market maker for a trade in the at least one instrument.

66. The apparatus according to claim 65, wherein the central controller aggregates all value-based buy orders for the at least one instrument into a single value-based buy order for the at least one instrument, and aggregates all value-based sell orders for the at least one instrument into a single value-based sell order for the at least one instrument.

67. The apparatus according to claim 65, wherein the central controller aggregates all share-based buy orders for the at least one instrument into a single share-based buy order for the at least one instrument, and aggregates all share-based sell orders for the at least one instrument into a single share-based sell order for the at least one instrument.

68. The apparatus according to claim 66, wherein the central controller nets the single dollar-based buy order for the at least one instrument against the single value-based sell order for at least one instrument to form a single value-based trading order for the at least one instrument.

69. The apparatus according to claim 67, wherein the central controller nets the single share-based buy order for the at least one instrument against the single share-based sell order for at least one instrument to form a single share-based trading order for the at least one instrument.

70. The apparatus according to claim 65, wherein the central controller:

single share-based trading order for the at least one instrument to form the plurality of contingent orders for the at least one instrument.

73. The apparatus according to claim 71, wherein the predetermined price includes a midpoint between a bid price and an ask price.

74. The apparatus according to claim 71, wherein the predetermined price includes a weighted average of a bid price and an ask price.

75. The apparatus according to claim 71, wherein the predetermined price includes a weighted average of a midpoint between a bid price and an ask price and either a bid price or an ask price.

76. The apparatus according to claim 71, wherein the predetermined price includes, for sell orders, a weighted average of a bid price and a midpoint between the bid price and an ask price, and for buy orders, a weighted average of the ask price and the midpoint.

77. The apparatus according to claim 71, wherein when buy orders exceed sell orders the predetermined price includes, for buy orders, a weighted average of an ask price and a midpoint between a bid price and the ask price, and for sell orders, the midpoint.

78. The apparatus according to claim 71, wherein when sell orders exceed buy orders the predetermined price includes, for sell orders, a weighted average of a bid price and a midpoint between the bid price and an ask price, and for buy orders, the midpoint.

79. An apparatus for executing trades in at least one instrument comprising:
a central controller for coupling to a communications network via which are received by the central controller a plurality of trading orders, including a plurality of value-based trading orders and a plurality of share-based trading orders, said central controller:

aggregating and netting a plurality of value-based trading orders for at least one instrument against each other to create a single value-based trading order for the at least one instrument;

aggregating and netting a plurality of share-based trading orders for the at least one instrument against each other to create a single share-based trading order for the at least one instrument; and

converting the single value-based trading order for the at least one instrument and the single share-based trading order for the at least one instrument into a series of contingent orders for the at least one instrument specifying a number of shares of the at least one instrument to be traded at a schedule of prices; and

a database storing the plurality of value-based orders and the plurality of share-based orders and the series of contingent orders, wherein said central controller transmits the series of contingent orders for the at least one instrument to a third party market maker for execution.

[illegible]

Figure 1

Figure 1 displays the mean values of the dependent variables for each group across four conditions. The y-axis represents the mean value, ranging from 0 to 100. The x-axis lists the groups: Control, Low Load, High Load, and Very High Load. The legend indicates four conditions: Rest (white bar), Low Intensity (light gray bar), Moderate Intensity (medium gray bar), and High Intensity (dark gray bar). Error bars represent standard error.

Group	Rest	Low Intensity	Moderate Intensity	High Intensity
Control	~78	~75	~72	~68
Low Load	~75	~72	~68	~65
High Load	~72	~68	~65	~62
Very High Load	~68	~65	~62	~58

[illegible]

Figure 1

Figure 1 displays the mean values of the dependent variables for each group across four conditions. The Y-axis represents the mean value, ranging from 0 to 100. The X-axis lists the groups: Control, Low Load, High Load, and Very High Load. The legend indicates four conditions: Baseline (white bar), 1st Session (light gray bar), 2nd Session (dark gray bar), and 3rd Session (black bar). Error bars represent standard error.

Group	Baseline	1st Session	2nd Session	3rd Session
Control	~85	~85	~85	~85
Low Load	~85	~85	~85	~85
High Load	~85	~85	~85	~85
Very High Load	~85	~85	~85	~85

Figure 1

Figure 1 displays the mean values of the dependent variables for each group across four conditions. The Y-axis represents the mean value, ranging from 0 to 100. The X-axis lists the groups: Control, Low Load, High Load, and Very High Load. The legend indicates four conditions: Baseline (white bar), 1st Session (light gray bar), 2nd Session (dark gray bar), and 3rd Session (black bar). Error bars represent standard error.

Group	Baseline	1st Session	2nd Session	3rd Session
Control	~78	~78	~78	~78
Low Load	~65	~65	~65	~65
High Load	~55	~55	~55	~55
Very High Load	~45	~45	~45	~45

wherein

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders;

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders; and

P = a price of the at least one instrument, where P is permitted to vary over a predetermined range.

84. The apparatus according to claim 83, wherein the central controller rounds to a nearest integer any value for the calculated number of shares in the schedule of prices that includes a fractional share.

85. The apparatus according to claim 79, wherein the central controller calculates the number of shares of the at least one instrument in the schedule of prices according to the following equations:

(1) for a buy order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P^*} - \frac{N_s^s}{P_m}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

wherein:

$$\alpha = N_s^b,$$

$$\beta = N_s^b - N_s^s P_m - N_s^s - P_a \left(N_s^b - N_s^s - \frac{N_s^s}{P_m} \right), \text{ and}$$

$$\gamma = -P_a N_s^b;$$

(2) for a sell order:

$$S^* = (N_s^b - N_s^s) + \frac{N_s^b}{P_m} - \frac{N_s^s}{P^*}$$

$$P^* = \begin{cases} \frac{-\beta \pm \sqrt{\beta^2 - 4\alpha\gamma}}{2\alpha} & \text{if } \alpha \neq 0 \\ \frac{\gamma}{\beta} & \text{if } \alpha = 0 \end{cases}$$

where

$$\alpha = -N_s^s,$$

$$\beta = -N_s^s + N_s^b P_m + N_s^b - P_b \left(-N_s^s + N_s^b + \frac{N_s^b}{P_m} \right), \text{ and}$$

$$\gamma = P_b N_s^s;$$

wherein:

S^* = the number of shares of the at least one instrument to be bought or, if negative, sold at a particular price P^* ;

N_s^b = a number of shares of the at least one instrument to be bought in the plurality of share-based trading orders;

N_s^s = a number of shares of the at least one instrument to be sold in the plurality of share-based trading orders;

N_s^b = a dollar amount of the at least one instrument to be bought in the plurality of dollar-based trading orders; and

N_s^s = a dollar amount of the at least one instrument to be sold in the plurality of dollar-based trading orders.

86. An apparatus for processing a plurality of trading orders for an instrument comprising:

a server receiving a plurality of currency-based trading orders, receiving a plurality of share-based trading orders; and

a central processor coupled to the server and aggregating and netting all currency-based trading orders in a similar currency to create a plurality of single-similar-currency-based trading orders, converting the plurality of single-similar-currency-based trading orders into a plurality of standard-currency-based trading orders using a predetermined currency exchange rate, aggregating and netting the plurality of standard-currency-based trading orders to create a single standard-currency-based trading order, converting the single standard-currency-based trading order to a share-based trading order using a

predetermined price for the instrument in the standard currency, and aggregating and netting the converted single standard-currency-based trading order and the single share-based trading order to form a plurality of contingent orders.

87. An apparatus for processing a plurality of trading orders for an instrument comprising:

a server for coupling to a communications network, said server receiving a plurality of value-based trading orders, each specified in a particular value basis, receiving a plurality of share-based trading orders; and

a central controller coupled to the server and aggregating and netting all value-based trading orders in a similar value basis to create a plurality of single-similar-value-basis-value-based trading orders, converting the plurality of single-similar-value-basis-value-based trading orders into a plurality of standard-currency-based trading orders using a predetermined exchange rate with regard to the value basis in the standard currency, aggregating and netting the plurality of standard-currency-based trading orders to create a single standard-currency-based trading order, converting the single standard-currency-based trading order to a share-based trading order using a predetermined price for the instrument in the standard currency, and aggregating and netting the converted single standard-currency-based trading order and the single share-based trading order to form a plurality of contingent orders.